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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/965,286	11/06/97	GOMI T	P97.2608

MM42/0914

HILL STEADMAN & SIMPSON
85TH FLOOR SEARS TOWER
CHICAGO IL 60606

EXAMINER	
NADAV,O	
ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 09/14/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/965,286	Gomi et al.
Examiner	**Group Art Unit**
ORI NADAV	2811

☒ Responsive to communication(s) filed on *Aug 3, 1999* .

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1, 3, 4, 6, and 17* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 3, 4, 6, and 17* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 3, 4, 6 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation "said first vertical type bipolar transistor" and "said second vertical type bipolar transistor" in lines 6 and 8, respectively. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 1 recites the structural limitation of a second bipolar transistor having an impurity concentration less than the impurity concentration of the first embedded diffusion layer. Since a bipolar transistor comprises of three separate layers each of which has different impurity concentration, it is unclear as to which layer applicant refers.

Claim Rejections - 35 USC § 103,

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 4 and 6, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Magdo et al. (4,357,622), Yagi et al. (4,038,680) or Lapham et al. (5,529,939).

Magdo et al. teach in figure 7 a semiconductor device comprising a first vertical high speed NPN bipolar transistor and a second vertical type high voltage PNP transistor whose breakdown voltage is higher than that of the first transistor, the device including an epitaxial layer 40 formed on a silicon substrate 10, wherein the first transistor has a first embedded diffusion layer 22 formed on an upper part of the substrate and has the same conductivity type and higher impurity concentration than that of the epitaxial layer, the second transistor has a second embedded diffusion layer 18 formed in an upper part of the substrate and has an impurity concentration less than the impurity concentration of the first embedded diffusion layer.

Magdo et al. do not teach a second NPN transistor. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a second NPN transistor in Magdo et al.'s device, because it is conventional in the art to reverse the polarity of a transistor. Therefore, it would be obvious to reverse the polarity, as claimed. Furthermore, Magdo et al.

teach the difficulties of forming a PNP transistor, and that a PNP transistor has inferior characteristics (column 1) in comparison to an NPN transistor. Therefore, one skilled in the art would be motivated to form a second NPN transistor in order to improve the performance of the device and to simplify its fabrication process.

Although Magdo et al. do not explicitly disclose a first high speed transistor and a second high voltage transistor having higher breakdown voltage than the first transistor, these features are inherent in Magdo et al.'s device, because Magdo et al.'s structure, which is identical to the claimed structure, comprises first and second embedded diffusion layers, thus rendering the first and second transistors as being high speed and high voltage, respectively.

Furthermore, the limitations of a first transistor functioning as a high speed transistor and a second transistor functioning as a high voltage transistor is a functional limitation. However, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Regarding claim 3, Magdo et al. teach a first embedded diffusion layer having a shallower depth than the second embedded diffusion layer.

Regarding claim 4, Magdo et al. teach a second embedded diffusion layer having a impurity concentration at least as high as that of the epitaxial layer.

Claim 6 is rejected to reasons of record, as recited in previous office action, paper 4.

Yagi et al. and Lapham et al. teach the same as above.

7. Claims 1, 3, 4, 6 and 17, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Magdo et al. Yagi et al. or Lapham et al. in view of Jennings et al. (4,910,160) for reasons of record, as recited in previous office action, paper 4.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 3, 4, 6 and 17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

Tom Thomas
Supervisory Patent Examiner
Technology Center 2800

Ori Nadav

July 28, 1999